Reg. No.

Question Paper Code: X11233

B.E./B.Tech. DEGREE EXAMINATIONS APRIL/MAY 2021

Eighth Semester

Aeronautical Engineering

AE8012 Wind Tunnel Techniques

(Regulations 2017)

Time : 3 Hours   Answer ALL Questions   Max. Marks: 100

PART-A (10 x 2 = 20 Marks)

1. List out the examples for Non- Dimensional Numbers?

2. Sketch the layout of open circuit wind tunnel.

3. Give the examples for high speed wind tunnels.

4. What do you mean by transonic tunnel?

5. What are the purposes of Calibration?

6. What are the classifications of wind tunnel balances?

7. State calibration.

8. Define uncertainty analysis

9. Explain image processing.

10. State Flow visualization.

PART- B (5 x 13 = 65 Marks)

11. a) Discuss about the closed circuit subsonic wind tunnel with respective sketch. (13)

                                                OR

    b) Briefly explain the types of non-dimensionless number. (13)

12. a) Sketch the typical layout of a supersonic wind tunnel and mark all the components and subsystems. What is starting problem in supersonic tunnels? (13)

                                                OR

    b) With a neat sketch explain in detail about the components, construction and working principle of In – draft and Induction tunnel. (13)

13. a) Explain the operation Gun tunnel and Shock tunnel. (13)

                                                OR

    b) Give the Classification of wind tunnel & explain about hypersonic wind tunnel. (13)

14. a) With a neat sketch explain about force measurements in wind tunnel. (13)

OR

b) Briefly, write the essential features of a strain gauge based Six-component internal wind tunnel balance. (13)

15. a) Explain flow visualization method by using smoke & tuft grid techniques. (13)

OR

b) With a neat sketch explain about dye injection techniques. (13)

PART C (1 x 15 = 15 Marks)

16. a) Explore the three optical methods schlieren, shadowgraph and interferometry and their relative advantages, disadvantages and applications, with relevant diagrams. (15)

OR

b) Evaluate in detail about Intake tests, Store carriage tests and separation tests with respective tests. (15)